



**Figure S2** Pairwise linkage disequilibrium (LD) ( $r^2$ ) between 92 common single nucleotide polymorphisms (SNP) markers (minor allele frequencies  $>0.10$ ) located in the cellulose synthase gene (*PtoCesA4*) in *Populus tomentosa*. A larger number of SNPs were in linkage equilibrium ( $r^2 < 0.3$ ,  $P < 0.001$ ); limited LD of the SNP loci within the candidate gene did not extend over the entire gene region, and several LD blocks were identified, such as SNPs 15-18, SNPs 34-40, and SNPs 60-66 ( $r^2 > 0.8$ ;  $P < 0.001$ ).